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Courses in Laboratory Diagnosis of Tuberculosis



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* This is the thirty-first of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the Mar. 1, 1946, issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946, issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at \$1.00 per year; \$1.25 foreign.

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—EDITORIAL—

Laboratory Services and Tuberculosis

Elsewhere in this issue appears the announcement of special courses to be given in the laboratory diagnosis of tuberculosis. One of these courses, which will be given for a period of two weeks, is intended for laboratory directors, senior staff members and physicians, while another, of four weeks' duration, will train laboratory technical personnel. The principal objectives of these courses will be to develop better understanding of the problems of laboratory diagnosis and to augment technical skills and knowledge of modern diagnostic techniques.

In the past few years, the rapid extension of case-finding activities throughout the States and territories has created an unprecedented demand for those laboratory services which are a necessary part of the diagnostic survey of newly discovered, suspected cases of tuberculosis. Indeed, the careful phthisiologist insists upon the full utilization of bacteriological aids to proper diagnostic evaluation. Unfortunately, however, many areas are still experiencing a woeful shortage of persons with the skill and training needed to provide reliable laboratory diagnostic services. As a result, case finding suffers because the accurate diagnosis of a suspected case is not accomplished. Moreover, the physician who works without the benefit of bacteriological services for tuberculous patients under his care labors under a severe handicap because he is deprived of an objective measure of the efficacy of treatment and, more important, lacks a reliable guide for estimating his patient's prognosis.

It follows that trained laboratory workers are indispensable in a program of tuberculosis control, especially in those activities relating to case finding, which is but another name for diagnosis, and in treatment, the complex regimen prescribed for a patient once a diagnosis of tuberculosis is made. Indeed, the importance of bacteriology to both these activities is too obvious to merit extended comment. Suffice it to say that the establishment of this training program should be

welcome news to all those who have responsibility for the control of tuberculosis.

It is now many years since Koch first raised the curtain upon the secret of tuberculous infection. In 1894, the first municipal laboratory in America (established in 1892 in New York City for service in cholera outbreaks) inaugurated routine examinations of sputa for the presence of tubercle bacilli. It is now generally accepted that what the tuberculin test is to the establishment of the presence of infection, and the X-ray to early case finding, bacteriological examination for tubercle bacilli is to the determination of clinical activity. In most cases, the presence of positive bacillary findings can be considered the most reliable proof of the presence of active disease and, by the same token, of infectiousness. Indeed, the appearance of tubercle bacilli in sputum, gastric contents or other body fluids is an extremely significant episode in the course of tuberculous infection. Hence, a thorough and systematic search for tubercle bacilli must be instituted in all cases where the presence of tuberculosis is suspected or where tuberculosis must be considered a possibility in differential diagnosis.

In the follow-up work incident to mass case-finding surveys, this Division has advocated the principles set forth in an earlier issue of this journal, in "Guide for Disposition of Persons with Abnormal Pulmonary Findings on X-ray Films" (from PUBLIC HEALTH REPORTS, Volume 61, No. 49, December 6, 1946). This guide, as many are now aware, places major emphasis upon the detection of tubercle bacilli as the only valid index of clinical activity in pulmonary tuberculosis. In actual practice, this procedure has been found to be of invaluable service, particularly in the assessment of minimal tuberculosis, which comprises the major problem in mass radiography, and which, as hidden disease, constitutes the principal reason for such undertakings. Since it is in the detection of these that we rest so many of our hopes for the ultimate eradication of tuberculosis, it follows that the bacteriologist must be considered as vital a member of the tuberculosis control team as the epidemiologist and clinician.

That this is not today a matter of routine practice, however, must be attributed largely to the dearth of trained personnel. The establishment of laboratory training facilities at the Communicable Disease Center in Atlanta is therefore an eminently hopeful step forward, and should do much to augment the corps of skilled workers available for service in the tuberculosis control effort. Great as it may be, however, this advance is merely a beginning, for the provision of adequate bacteriological diagnostic services will require not one, but several such training centers, so placed as to render maximum service to the entire tuberculosis control program.

FRANCIS J. WEBER, *Medical Director,*
Chief, Tuberculosis Control Division.

Tuberculosis Deaths in the United States by County, 1946¹

Mortality statistics for counties were graphically presented for the average of the years 1939 through 1941 in volume 4 of Tuberculosis in the United States, Graphic Presentation, published by the Tuberculosis Control Division in cooperation with the National Tuberculosis Association.² That presentation gave not only numbers of deaths but also death rates based on the population census of 1940. Subsequent information on tuberculosis deaths by county appears in Vital Statistics of the United States—Part II, 1945, published by the National Office of Vital Statistics.

At the time of this writing, the most recent mortality information for counties compiled on a national basis is that for the year 1946. This report therefore presents the number of deaths from tuberculosis, all forms, for each county for the year 1946 by place of residence of the decedent. Since it has not been possible for the Bureau of the Census to make population estimates for all counties for 1946, this report does not present county tuberculosis death rates. It should be noted, therefore, that the data appearing in this report, which concern themselves entirely with numbers of tuberculosis deaths, do not reflect tuberculosis mortality risks; changes in the numbers of deaths from the 1939–1941 period and from 1945 may be due to changes in population rather than to variations in mortality risk. Despite this limitation, the numbers of deaths are presented here as an aid to the health officer concerned with the control of tuberculosis.

In some cases, the crude number of tuberculosis deaths among residents of an area may serve as an index to the effectiveness of local case finding when compared with the total number of newly reported cases for the same period. In similar fashion, the number of deaths and the trend in the number may be utilized in evaluating the need for control facilities and personnel. Moreover, in those areas where the health officer and tuberculosis control worker are in a position to estimate the local population, the crude numbers may be converted to death rates, which may prove of value in reviewing, in part, the local trend of tuberculosis mortality.

For some counties, however, where the numbers of tuberculosis deaths recorded for a single year are small, data may be subject to relatively serious sampling fluctuations. In these cases, the average

¹ From the Office of the Chief, Tuberculosis Control Division, with the cooperation of the National Office of Vital Statistics.

² A limited number of copies is available upon request from the Publications Section, Tuberculosis Control Division.

number of deaths for a 2- or 3-year period, or the trend of deaths over a longer period, will provide a more reliable index of the tuberculosis problem than a single year's experience.

In addition to sampling fluctuations, there are a number of important factors in the interpretation of tuberculosis mortality figures for counties. A knowledge of the location of tuberculosis sanatoria and mental hospitals is necessary, since a large number of tuberculosis deaths occur in such institutions. Deaths occurring in tuberculosis sanatoria among patients who have resided therein for a year or more, and all deaths in mental hospitals are allocated to the county in which the institution is situated. Thus one may expect to find relatively high tuberculosis mortality in these counties. In this respect, volume 4 of *Tuberculosis in the United States, Graphic Presentation*, should prove helpful in that it presents the location of Federal and State tuberculosis sanatoria and mental hospitals in each State.

A further consideration which may affect the data contained in this report is the character of a county's population. Tuberculosis mortality is known to vary greatly with age, race, and sex. It is also known to vary with urbanization, occupation, income, and other demographic and socio-economic factors. Hence, changes in the demography of a given county may markedly affect the trend of deaths due to tuberculosis.

Other considerations in evaluating tuberculosis mortality data for an area are the completeness of death registration and the completeness and accuracy of reporting cause of death.

Tuberculosis Deaths, All Forms, in the United States, 1946 ¹

(By county of residence)

Total—United States..... 50, 911

County	Number of deaths	County	Number of deaths
ALABAMA:		Coffee.....	2
Total.....	1, 122	Colbert.....	19
Autauga.....	6	Conecuh.....	3
Baldwin.....	11	Coosa.....	-----
Barbour.....	10	Covington.....	7
Bibb.....	5	Crenshaw.....	5
Blount.....	5	Cullman.....	9
Bullock.....	4	Dale.....	3
Butler.....	6	Dallas.....	25
Calhoun.....	31	De Kalb.....	15
Chambers.....	6	Elmore.....	11
Cherokee.....	5	Escambia.....	6
Chilton.....	8	Etowah.....	31
Choctaw.....	4	Fayette.....	6
Clarke.....	7	Franklin.....	12
Clay.....	1	Geneva.....	3
Cleburne.....	3	Greene.....	6

Source: National Office of Vital Statistics.

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
ALABAMA—Continued		Bradley	9
Hale	10	Calhoun	2
Henry	4	Carroll	2
Houston	5	Chicot	13
Jackson	15	Clark	6
Jefferson	270	Clay	8
Lamar	2	Cleburne	1
Lauderdale	23	Cleveland	-----
Lawrence	9	Columbia	9
Lee	8	Conway	7
Limestone	21	Craighead	13
Lowndes	4	Crawford	6
Macon	21	Crittenden	24
Madison	46	Cross	6
Marengo	10	Dallas	10
Marion	3	Desha	6
Marshall	19	Drew	6
Mobile	108	Faulkner	9
Monroe	6	Franklin	2
Montgomery	67	Fulton	5
Morgan	12	Garland	20
Perry	10	Grant	-----
Pickens	9	Greene	14
Pike	11	Hempstead	12
Randolph	-----	Hot Spring	5
Russell	7	Howard	6
Saint Clair	12	Independence	4
Shelby	8	Izard	2
Sumter	10	Jackson	8
Talladega	15	Jefferson	23
Tallapoosa	6	Johnson	3
Tuscaloosa	63	Lafayette	6
Walker	11	Lawrence	2
Washington	1	Lee	10
Wilcox	12	Lincoln	5
Winston	9	Little River	1
ARIZONA:		Logan	33
Total	727	Lonoke	8
Apache	52	Madison	3
Cochise	24	Marion	4
Coconino	20	Miller	11
Gila	28	Mississippi	21
Graham	6	Monroe	5
Greenlee	6	Montgomery	2
Maricopa	293	Nevada	5
Mohave	1	Newton	2
Navajo	40	Ouachita	14
Pima	178	Perry	-----
Pinal	34	Phillips	25
Santa Cruz	4	Pike	4
Yavapai	24	Poinsett	13
Yuma	17	Polk	2
ARKANSAS:		Pope	6
Total	699	Prairie	2
Arkansas	5	Pulaski	91
Ashley	7	Randolph	2
Baxter	5	Saint Francis	23
Benton	10	Saline	52
Boone	5	Scott	3
		Searcy	2
		Sebastian	21

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
ARKANSAS—Continued			
Sevier.....	2	Stanislaus.....	16
Sharp.....	1	Sutter.....	3
Stone.....	2	Tehama.....	2
Union.....	12	Trinity.....	—
Van Buren.....	3	Tulare.....	43
Washington.....	7	Tuolumne.....	7
White.....	11	Ventura.....	59
Woodruff.....	5	Yolo.....	11
Yell.....	5	Yuba.....	11
CALIFORNIA:		COLORADO:	
Total.....	3, 959	Total.....	401
Alameda.....	278	Adams.....	25
Alpine.....	—	Alamosa.....	1
Amador.....	5	Arapahoe.....	21
Butte.....	23	Archuleta.....	—
Calaveras.....	6	Baca.....	—
Colusa.....	1	Bent.....	3
Contra Costa.....	53	Boulder.....	16
Del Norte.....	2	Chaffee.....	—
Eldorado.....	7	Cheyenne.....	—
Fresno.....	104	Clear Creek.....	2
Glenn.....	5	Conejos.....	1
Humboldt.....	27	Costilla.....	1
Imperial.....	30	Crowley.....	1
Inyo.....	6	Custer.....	—
Kern.....	81	Delta.....	—
Kings.....	19	Denver.....	127
Lake.....	7	Dolores.....	—
Lassen.....	3	Douglas.....	3
Los Angeles.....	1, 438	Eagle.....	1
Madera.....	20	Elbert.....	—
Marin.....	17	El Paso.....	36
Mariposa.....	—	Fremont.....	4
Mendocino.....	29	Garfield.....	—
Merced.....	29	Gilpin.....	1
Modoc.....	3	Grand.....	1
Mono.....	—	Gunnison.....	1
Monterey.....	32	Hinsdale.....	—
Napa.....	69	Huerfano.....	3
Nevada.....	11	Jackson.....	—
Orange.....	53	Jefferson.....	42
Placer.....	51	Kiowa.....	—
Plumas.....	6	Kit Carson.....	—
Riverside.....	88	Lake.....	—
Sacramento.....	128	La Plata.....	4
San Benito.....	7	Larimer.....	5
San Bernardino.....	144	Las Animas.....	11
San Diego.....	128	Lincoln.....	2
San Francisco.....	440	Logan.....	2
San Joaquin.....	144	Mesa.....	6
San Luis Obispo.....	19	Mineral.....	1
San Mateo.....	57	Moffat.....	—
Santa Barbara.....	30	Montezuma.....	2
Santa Clara.....	97	Montrose.....	2
Santa Cruz.....	20	Morgan.....	8
Shasta.....	13	Otero.....	8
Sierra.....	—	Ouray.....	—
Siskiyou.....	8	Park.....	—
Solano.....	33	Phillips.....	—
Sonoma.....	36	Pitkin.....	—
		Prowers.....	1

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
COLORADO—Continued		Hernando	1
Pueblo	39	Highlands	2
Rio Blanco	2	Hillsborough	81
Rio Grande		Holmes	3
Routt		Indian River	3
Saguache	1	Jackson	12
San Juan	2	Jefferson	
San Miguel	1	Lafayette	1
Sedgwick		Lake	10
Summit		Lee	6
Teller		Leon	4
Washington	1	Levy	2
Weld	13	Liberty	
Yuma		Madison	5
CONNECTICUT:		Manatee	3
Total	589	Marion	9
Fairfield	134	Martin	1
Hartford	174	Monroe	6
Litchfield	15	Nassau	1
Middlesex	35	Okaloosa	1
New Haven	154	Okeechobee	1
New London	64	Orange	32
Tolland	3	Osceola	5
Windham	10	Palm Beach	26
DELAWARE:		Pasco	6
Total	133	Pinellas	40
Kent	10	Polk	27
New Castle	96	Putnam	4
Sussex	27	Saint Johns	5
DISTRICT of COLUMBIA		Saint Lucie	4
	488	Santa Rosa	3
FLORIDA:		Sarasota	4
Total	721	Seminole	8
Alachua	12	Sumter	3
Baker	3	Suwannee	4
Bay	4	Taylor	2
Bradford	2	Union	9
Brevard	8	Volusia	11
Broward	12	Wakulla	1
Calhoun	2	Walton	5
Charlotte	1	Washington	1
Citrus		GEORGIA:	
Clay		Total	1,070
Collier	1	Appling	3
Columbia	6	Atkinson	
Dade	118	Bacon	2
De Soto	1	Baker	1
Dixie		Baldwin	122
Duval	122	Banks	2
Escambia	36	Barrow	
Flagler	1	Bartow	12
Franklin		Ben Hill	1
Gadsden	30	Berrien	2
Gilchrist		Bibb	39
Glades		Bleckley	3
Gulf	2	Brantley	1
Hamilton	4	Brooks	7
Hardee	2	Bryan	3
Hendry	2	Bulloch	4
		Burke	1
		Butts	1

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
GEORGIA—Continued		Jeff Davis	2
Calhoun	1	Jefferson	4
Camden	4	Jenkins	7
Candler	2	Johnson	1
Carroll	9	Jones	3
Catoosa	4	Lamar	2
Charlton		Lanier	
Chatham	65	Laurens	5
Chattahoochee	1	Lee	
Chattooga	17	Liberty	3
Cherokee	3	Lincoln	1
Clarke	10	Long	2
Clay		Lowndes	9
Clayton	3	Lumpkin	1
Clinch	1	McDuffie	2
Cobb	11	McIntosh	1
Coffee	7	Macon	2
Colquitt	6	Madison	
Columbia		Marion	3
Cook	3	Meriwether	3
Coweta	3	Miller	1
Crawford		Mitchell	4
Crisp	5	Monroe	8
Dade	4	Montgomery	
Dawson	1	Morgan	2
Decatur	3	Murray	3
De Kalb	35	Muscogee	32
Dodge	3	Newton	4
Dooley	1	Oconee	1
Dougherty	9	Oglethorpe	1
Douglas	1	Paulding	4
Early	11	Peach	4
Echols		Pickens	
Effingham	2	Pierce	1
Elbert	6	Pike	2
Emanuel	2	Polk	7
Evans	2	Pulaski	1
Fannin	6	Putnam	1
Fayette		Quitman	2
Floyd	29	Rabun	
Forsyth	2	Randolph	1
Franklin	5	Richmond	62
Fulton	206	Rockdale	1
Gilmer	2	Schley	1
Glascock		Screven	4
Glynn	8	Seminole	1
Gordon	4	Spaulding	4
Grady	2	Stephens	3
Greene	4	Stewart	1
Gwinnett	2	Sumter	9
Habersham	8	Talbot	1
Hall	6	Taliaferro	2
Hancock	3	Tattnall	2
Harralson	3	Taylor	
Harris	2	Telfair	5
Hart		Terrell	4
Heard	1	Thomas	11
Henry	7	Tift	3
Houston	3	Toombs	4
Irwin		Towns	
Jackson	1	Treutlen	1
Jasper	4	Troup	11

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
GEORGIA—Continued		Shoshone.....	8
Turner.....	1	Teton.....	1
Twiggs.....	3	Twin Falls.....	3
Union.....	—	Valley.....	—
Upson.....	6	Washington.....	—
Walker.....	8		
Walton.....	3	ILLINOIS:	
Ware.....	6	Total.....	3, 014
Warren.....	—	Adams.....	17
Washington.....	5	Alexander.....	13
Wayne.....	1	Bond.....	—
Webster.....	1	Boone.....	—
Wheeler.....	—	Brown.....	5
White.....	—	Bureau.....	3
Whitfield.....	16	Calhoun.....	1
Wilcox.....	3	Carroll.....	—
Wilkes.....	2	Cass.....	2
Wilkinson.....	3	Champaign.....	7
Worth.....	5	Christian.....	3
		Clark.....	4
IDAHO:		Clay.....	1
Total.....	67	Clinton.....	1
Ada.....	11	Coles.....	6
Adams.....	—	Cook.....	1, 945
Bannock.....	4	Crawford.....	3
Bear Lake.....	—	Cumberland.....	1
Benewah.....	1	De Kalb.....	6
Bingham.....	3	De Witt.....	2
Blaine.....	1	Douglas.....	1
Boise.....	—	Du Page.....	23
Bonner.....	1	Edgar.....	8
Bonneville.....	2	Edwards.....	3
Boundary.....	1	Effingham.....	4
Butte.....	—	Fayette.....	4
Camas.....	—	Ford.....	1
Canyon.....	7	Franklin.....	20
Caribou.....	1	Fulton.....	6
Cassia.....	2	Gallatin.....	—
Clark.....	—	Greene.....	5
Clearwater.....	1	Grundy.....	3
Custer.....	1	Hamilton.....	7
Elmore.....	1	Hancock.....	—
Franklin.....	—	Hardin.....	10
Fremont.....	1	Henderson.....	2
Gem.....	2	Henry.....	10
Gooding.....	1	Iroquois.....	1
Idaho.....	1	Jackson.....	5
Jefferson.....	—	Jasper.....	2
Jerome.....	—	Jefferson.....	10
Kootenai.....	7	Jersey.....	—
Latah.....	2	Jo Daviess.....	2
Lemhi.....	—	Johnson.....	2
Lewis.....	—	Kane.....	54
Lincoln.....	—	Kankakee.....	124
Madison.....	—	Kendall.....	1
Minidoka.....	1	Knox.....	4
Nez Perce.....	3	Lake.....	29
Oneida.....	—	La Salle.....	16
Owyhee.....	—	Lawrence.....	3
Payette.....	—	Lee.....	45
Power.....	—	Livingston.....	12

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
ILLINOIS—Continued		Clark	15
Logan	18	Clay	4
McDonough	8	Clinton	6
McHenry	7	Crawford	7
McLean	14	Daviess	6
Macon	17	Dearborn	7
Macoupin	4	Decatur	5
Madison	58	De Kalb	6
Marion	10	Delaware	12
Marshall	2	Dubois	2
Mason	5	Elkhart	8
Massac	3	Fayette	7
Menard	2	Floyd	10
Mercer	1	Fountain	7
Monroe	1	Franklin	10
Montgomery	1	Fulton	2
Morgan	21	Gibson	6
Moultrie	1	Grant	30
Ogle	1	Greene	2
Peoria	56	Hamilton	7
Perry		Hancock	2
Piatt		Harrison	2
Pike	4	Hendricks	6
Pope	1	Henry	13
Pulaski	8	Howard	13
Putnam		Huntington	3
Randolph	11	Jackson	8
Richland	3	Jasper	2
Rock Island	36	Jay	3
Saint Clair	50	Jefferson	16
Saline	14	Jennings	9
Sangamon	43	Johnson	3
Schuyler	3	Knox	15
Scott	2	Kosciusko	3
Shelby	3	Lagrange	1
Stark		Lake	132
Stephenson	5	La Porte	20
Tazewell	10	Lawrence	8
Union	27	Madison	26
Vermilion	37	Marion	222
Wabash	2	Marshall	1
Warren	1	Martin	3
Washington	1	Miami	6
Wayne	5	Monroe	13
White	4	Montgomery	4
Whiteside	3	Morgan	7
Will	29	Newton	2
Williamson	18	Noble	5
Winnebago	26	Ohio	1
Woodford	1	Orange	7
		Owen	3
		Parks	8
		Perry	6
		Pike	3
		Porter	6
		Posey	10
		Pulaski	1
		Putnam	5
		Randolph	9
		Ripley	4
		Rush	8
		Saint Joseph	55
INDIANA:			
Total	1, 128		
Adams	2		
Allen	50		
Bartholomew	9		
Benton	2		
Blackford	1		
Boone	6		
Brown	1		
Carroll			
Cass	36		

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
INDIANA—Continued		Grundy	—
Scott	3	Guthrie	—
Shelby	10	Hamilton	1
Spencer	2	Hancock	1
Starke	4	Hardin	2
Steuben	2	Harrison	2
Sullivan	5	Henry	10
Switzerland	2	Howard	1
Tippecanoe	12	Humboldt	1
Tipton	5	Ida	2
Union	2	Iowa	2
Vanderburgh	56	Jackson	1
Vermillion	4	Jasper	4
Vigo	24	Jefferson	1
Wabash	6	Johnson	23
Warren	2	Jones	2
Warrick	4	Keokuk	—
Washington	5	Kossuth	—
Wayne	33	Lee	8
Wells	2	Linn	15
White	1	Louisa	1
Whitley	4	Lucas	—
		Lyon	—
IOWA:		Madison	1
Total	329	Mahaska	4
Adair	1	Marion	4
Adams	—	Marshall	3
Allamakee	2	Mills	5
Appanoose	—	Mitchell	1
Audubon	—	Monona	3
Benton	1	Monroe	1
Black Hawk	9	Montgomery	1
Boone	13	Muscatine	5
Bremer	2	O'Brien	2
Buchanan	5	Osceola	1
Buena Vista	—	Page	20
Butler	1	Palo Alto	1
Calhoun	2	Plymouth	1
Carroll	—	Pocahontas	2
Cass	2	Polk	27
Cedar	1	Pottawattamie	10
Cerro Gordo	4	Poweshiek	1
Cherokee	11	Ringgold	1
Chickasaw	2	Sac	2
Clarke	—	Scott	14
Clay	1	Shelby	—
Clayton	1	Sioux	1
Clinton	7	Story	3
Crawford	1	Tama	—
Dallas	2	Taylor	1
Davis	—	Union	3
Decatur	2	Van Buren	3
Delaware	2	Wapello	6
Des Moines	12	Warren	—
Dickinson	—	Washington	1
Dubuque	12	Wayne	5
Emmet	1	Webster	2
Fayette	1	Winnebago	—
Floyd	2	Winneshiek	1
Franklin	1	Woodbury	8
Fremont	1	Worth	2
Greene	2	Wright	2

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
KANSAS:			
Total	307	Miami.....	10
Allen.....	2	Mitchell.....	4
Anderson.....	1	Montgomery.....	—
Atchison.....	7	Morris.....	—
Barber.....	—	Morton.....	—
Barton.....	1	Nemaha.....	—
Bourbon.....	2	Neosho.....	—
Brown.....	2	Ness.....	—
Butler.....	1	Norton.....	27
Chase.....	1	Osage.....	2
Chautauqua.....	—	Osborne.....	2
Cherokee.....	21	Ottawa.....	1
Cheyenne.....	—	Pawnee.....	3
Clark.....	—	Phillips.....	1
Clay.....	1	Pottawatomie.....	2
Cloud.....	3	Pratt.....	—
Coffey.....	2	Rawlins.....	—
Comanche.....	—	Reno.....	2
Cowley.....	12	Republic.....	1
Crawford.....	8	Rice.....	—
Decatur.....	—	Riley.....	1
Dickinson.....	—	Rooks.....	—
Doniphan.....	2	Rush.....	1
Douglas.....	1	Russell.....	3
Edwards.....	—	Saline.....	3
Elk.....	1	Scott.....	—
Ellis.....	2	Sedwick.....	34
Ellsworth.....	—	Seward.....	—
Finney.....	—	Shawnee.....	18
Ford.....	3	Sheridan.....	—
Franklin.....	4	Sherman.....	—
Geary.....	—	Smith.....	1
Gove.....	—	Stafford.....	1
Graham.....	—	Stanton.....	—
Grant.....	—	Stevens.....	—
Gray.....	—	Sumner.....	2
Greeley.....	—	Thomas.....	—
Greenwood.....	—	Trego.....	2
Hamilton.....	1	Wabaunsee.....	—
Harper.....	1	Wallace.....	—
Harvey.....	1	Washington.....	—
Haskell.....	—	Wichita.....	—
Hodgeman.....	—	Wilson.....	2
Jackson.....	1	Woodson.....	1
Jefferson.....	—	Wyandotte.....	51
Jewell.....	—		
Johnson.....	2	KENTUCKY:	
Kearny.....	—	Total	1,602
Kingman.....	—	Adair.....	15
Kiowa.....	—	Allen.....	11
Labette.....	7	Anderson.....	5
Lane.....	1	Ballard.....	4
Leavenworth.....	31	Barren.....	18
Lincoln.....	—	Bath.....	9
Linn.....	1	Bell.....	23
Logan.....	—	Boone.....	5
Lyon.....	3	Bourbon.....	9
McPherson.....	1	Boyd.....	23
Marion.....	1	Boyle.....	7
Marshall.....	3	Bracken.....	1
Meade.....	1	Breathitt.....	11
		Breckinridge.....	9

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
KENTUCKY—Continued		Madison	22
Bullitt	4	Magoffin	2
Butler	4	Marion	8
Caldwell	8	Marshall	10
Calloway	8	Martin	4
Campbell	26	Mason	12
Carlisle	3	Meade	2
Carroll	3	Menifee	2
Carter	1	Mercer	7
Casey	15	Metcalfe	11
Christian	67	Monroe	13
Clark	14	Montgomery	5
Clay	5	Morgan	6
Clinton	4	Muhlenberg	13
Crittenden	12	Nelson	13
Cumberland	13	Nicholas	4
Caviess	8	Ohio	9
Edmonson	3	Oldham	6
Elliott	2	Owen	6
Estill	13	Owsley	7
Fayette	114	Pendleton	6
Fleming	7	Perry	14
Floyd	31	Pike	37
Franklin	12	Powell	7
Fulton	3	Pulaski	13
Gallatin	5	Robertson	1
Garrard	8	Rockcastle	7
Grant	5	Rowan	8
Graves	19	Russell	5
Grayson	12	Scott	6
Green	5	Shelby	12
Greenup	11	Simpson	8
Hancock	1	Spencer	6
Hardin	14	Taylor	12
Harlan	19	Todd	8
Harrison	12	Trigg	9
Hart	11	Trimble	2
Henderson	5	Union	5
Henry	9	Warren	25
Hickman	4	Washington	8
Hopkins	13	Wayne	9
Jackson	4	Webster	9
Jefferson	320	Whitley	11
Jessamine	4	Wolfe	4
Johnson	17	Woodford	4
Kenton	41		
Knott	3	LOUISIANA:	
Knox	15	Total	1, 089
Larue	4	Acadia	14
Laurel	8	Allen	9
Lawrence	6	Ascension	11
Lee	4	Assumption	5
Leslie	2	Avoyelles	7
Letcher	10	Beauregard	5
Lewis	8	Bienville	9
Lincoln	8	Bossier	12
Livingston	5	Caddo	73
Logan	16	Calcasieu	18
Lyon	4	Caldwell	1
McCracken	25	Cameron	-----
McCreary	10	Catahoula	3
McLean	7	Claiborne	13

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
LOUISIANA—Continued		Oxford	11
Concordia	5	Penobscot	37
De Soto	6	Piscataquis	3
East Baton Rouge	43	Sagadahoc	—
East Carroll	5	Somerset	21
East Feliciana	54	Waldo	3
Evangeline	15	Washington	6
Franklin	11	York	9
Grant	2		
Iberia	8	MARYLAND:	
Iberville	12	Total	1, 186
Jackson	12	Allegany	20
Jefferson	5	Anne Arundel	60
Jefferson Davis	6	Baltimore	90
Lafayette	24	Baltimore City	641
Lafourche	9	Calvert	5
La Salle	8	Caroline	7
Lincoln	10	Carroll	69
Livingston	5	Cecil	18
Madison	13	Charles	9
Morehouse	5	Dorchester	13
Natchitoches	15	Frederick	36
Orleans	341	Garrett	1
Ouachita	41	Harford	15
Plaquemines	3	Howard	4
Pointe Coupee	5	Kent	4
Rapides	59	Montgomery	16
Red River	2	Prince Georges	67
Richland	9	Queen Annes	7
Sabine	2	Saint Marys	11
St. Bernard	1	Somerset	15
St. Charles	1	Talbot	7
St. Helena	5	Washington	24
St. James	2	Wicomico	30
St. John the Baptist	3	Worcester	17
St. Landry	30		
St. Martin	17	MASSACHUSETTS:	
St. Mary	8	Total	1, 664
St. Tammany	8	Barnstable	10
Tangipahoa	22	Berkshire	28
Tensas	8	Bristol	153
Terrebonne	6	Dukes	1
Union	1	Essex	161
Vermilion	15	Franklin	5
Vernon	6	Hampden	104
Washington	17	Hampshire	27
Webster	10	Middlesex	299
West Baton Rouge	2	Nantucket	1
West Carroll	5	Norfolk	121
West Feliciana	5	Plymouth	42
Winn	2	Suffolk	495
		Worcester	217
MAINE:			
Total	216	MICHIGAN:	
Androscoggin	20	Total	1, 891
Arrostock	23	Alcona	2
Cumberland	32	Alger	1
Franklin	6	Allegan	6
Hancock	10	Alpena	2
Kennebec	26	Antrim	—
Knox	8	Arenac	3
Lincoln	1	Baraga	2

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
MICHIGAN—Continued		Otsego.....	7
Barry.....	1	Ottawa.....	5
Bay.....	6	Presque Isle.....	3
Benzie.....	1	Rosecommon.....	1
Berrien.....	25	Saginaw.....	36
Branch.....	7	Saint Clair.....	14
Calhoun.....	34	Saint Joseph.....	8
Cass.....	2	Sanilac.....	4
Charlevoix.....	4	Schoolcraft.....	2
Cheboygan.....	—	Shiawassee.....	4
Chippewa.....	4	Tuscola.....	16
Clare.....	—	Van Buren.....	2
Clinton.....	3	Washtenaw.....	32
Crawford.....	—	Wayne.....	1, 122
Delta.....	6	Wexford.....	2
Dickinson.....	6		
Eaton.....	5	MINNESOTA:	
Emmet.....	4	Total.....	585
Genesee.....	36	Aitkin.....	2
Gladwin.....	—	Anoka.....	8
Gogebic.....	16	Becker.....	2
Grand Traverse.....	20	Beltrami.....	10
Gratiot.....	2	Benton.....	—
Hillsdale.....	—	Big Stone.....	—
Houghton.....	22	Blue Earth.....	3
Huron.....	2	Brown.....	5
Ingham.....	18	Carlton.....	5
Ionia.....	19	Carver.....	4
Iosco.....	3	Cass.....	25
Iron.....	8	Chippewa.....	8
Isabella.....	1	Chisago.....	1
Jackson.....	25	Clay.....	2
Kalamazoo.....	40	Clearwater.....	1
Kalkaska.....	—	Cook.....	—
Kent.....	44	Cottonwood.....	—
Keweenaw.....	1	Crow Wing.....	9
Lake.....	1	Dakota.....	2
Lapeer.....	14	Dodge.....	1
Leelanau.....	2	Douglas.....	3
Lenawee.....	12	Faribault.....	1
Livingston.....	19	Fillmore.....	1
Luce.....	12	Freeborn.....	2
Mackinac.....	—	Goodhue.....	2
Macomb.....	27	Grant.....	1
Manistee.....	3	Hennepin.....	162
Marquette.....	16	Houston.....	1
Mason.....	4	Hubbard.....	3
Mecosta.....	2	Isanti.....	3
Menominee.....	14	Itasca.....	11
Midland.....	3	Jackson.....	1
Missaukee.....	2	Kanabec.....	—
Monroe.....	8	Kandiyohi.....	29
Montcalm.....	2	Kittson.....	—
Montmorency.....	1	Koochiching.....	1
Muskegon.....	33	Lac qui Parle.....	1
Newaygo.....	2	Lake.....	—
Oakland.....	68	Lake of the Woods.....	—
Oceana.....	—	Le Sueur.....	—
Ogemaw.....	1	Lincoln.....	1
Ontonagon.....	5	Lyon.....	2
Osceola.....	1	McLeod.....	1
Oscoda.....	—	Mahnomen.....	1

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
MINNESOTA—Continued			
Marshall	3	Covington	3
Martin	1	De Soto	10
Meeker	2	Forrest	9
Mille Lacs	2	Franklin	2
Morrison	2	George	1
Mower	4	Greene	1
Murray		Grenada	8
Nicollet	20	Hancock	3
Nobles	4	Harrison	21
Norman	3	Hinds	48
Olmsted	17	Holmes	13
Otter Tail	18	Humphreys	12
Pennington	6	Issaquena	2
Pine	1	Itawamba	3
Pipestone		Jackson	7
Polk	10	Jasper	4
Pope	2	Jefferson	4
Ramsey	61	Jefferson Davis	2
Red Lake		Jones	12
Redwood	1	Kemper	6
Renville	3	Lafayette	7
Rice	9	Lamar	1
Rock	1	Lauderdale	21
Roseau	3	Lawrence	3
Saint Louis	56	Leake	6
Scott	3	Lee	15
Sherburne	1	Leflore	28
Sibley	1	Lincoln	6
Stearns	9	Lowndes	9
Steele	3	Madison	21
Stevens	2	Marion	3
Swift		Marshall	7
Todd	4	Monroe	12
Traverse	2	Montgomery	5
Wabasha	3	Neshoba	6
Wadena	3	Newton	6
Waseca	2	Noxubee	10
Washington	1	Oktibbeha	11
Watonwan	1	Panola	10
Wilkin		Pearl River	10
Winona	4	Perry	3
Wright	1	Pike	11
Yellow Medicine	1	Pontotoc	10
		Prentiss	8
MISSISSIPPI:		Quitman	11
Total	741	Rankin	34
Adams	9	Scott	7
Alcorn	13	Sharkey	3
Amite	6	Simpson	9
Attala	7	Smith	5
Benton		Stone	1
Bolivar	28	Sunflower	23
Calhoun	3	Tallahatchie	17
Carroll	5	Tate	10
Chickasaw	3	Tippah	6
Choctaw	2	Tishomingo	1
Claiborne	4	Tunica	15
Clarke	9	Union	6
Clay	3	Walthall	5
Coahoma	22	Warren	16
Copiah	10	Washington	15
		Wayne	4

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
MISSISSIPPI—Continued		Lafayette	5
Webster	3	Lawrence	51
Wilkinson	7	Lewis	4
Winston	10	Lincoln	7
Yalobusha	4	Linn	6
Yazoo	5	Livingston	—
MISSOURI:		McDonald	2
Total	1, 276	Macon	7
Adair	4	Madison	5
Andrew	1	Maries	—
Atchison	2	Marion	6
Audrain	6	Mercer	2
Barry	5	Miller	1
Barton	1	Mississippi	12
Bates	3	Moniteau	2
Benton	4	Monroe	2
Bollinger	1	Montgomery	3
Boone	10	Morgan	2
Buchanan	45	New Madrid	11
Butler	15	Newton	5
Caldwell	2	Nodaway	—
Callaway	13	Oregon	3
Camden	3	Osage	—
Cape Girardeau	6	Ozark	2
Carroll	6	Pemiscot	18
Carter	2	Perry	2
Cass	1	Pettis	6
Cedar	3	Phelps	3
Chariton	2	Pike	3
Christian	2	Platte	1
Clark	3	Polk	5
Clay	11	Pulaski	3
Clinton	2	Putnam	2
Cole	5	Ralls	2
Cooper	1	Randolph	8
Crawford	4	Ray	2
Dade	3	Reynolds	1
Dallas	1	Ripley	4
Davies	3	Saint Charles	5
De Kalb	—	Saint Clair	1
Dent	3	Sainte Genevieve	2
Douglas	3	Saint Francois	17
Dunklin	16	Saint Louis, City	306
Franklin	9	Saint Louis	162
Gasconade	—	Saline	19
Gentry	1	Schuyler	2
Greene	19	Scotland	3
Grundy	3	Scott	8
Harrison	—	Shannon	2
Henry	4	Shelby	1
Hickory	—	Stoddard	8
Holt	1	Stone	5
Howard	5	Sullivan	1
Howell	7	Taney	4
Iron	1	Texas	7
Jackson	179	Vernon	12
Jasper	59	Warren	1
Jefferson	11	Washington	4
Johnson	2	Wayne	4
Knox	1	Webster	3
Laclede	3	Worth	—
		Wright	4

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
MONTANA:		NEBRASKA:	
Total	164	Total	177
Beaverhead.....	3	Adams.....	6
Big Horn.....	10	Antelope.....	—
Blaine.....	3	Arthur.....	—
Broadwater.....	—	Banner.....	1
Carbon.....	3	Blaine.....	—
Carter.....	—	Boone.....	1
Cascade.....	10	Box Butte.....	2
Chouteau.....	—	Boyd.....	—
Custer.....	1	Brown.....	1
Daniels.....	—	Buffalo.....	12
Dawson.....	—	Burt.....	—
Deer Lodge.....	16	Butler.....	1
Fallen.....	—	Cass.....	1
Fergus.....	—	Cedar.....	—
Flathead.....	2	Chase.....	—
Gallatin.....	1	Cherry.....	1
Garfield.....	—	Cheyenne.....	—
Glacier.....	20	Clay.....	—
Golden Valley.....	—	Colfax.....	—
Granite.....	1	Cumming.....	—
Hill.....	6	Custer.....	1
Jefferson.....	3	Dakota.....	—
Judith Basin.....	—	Dawes.....	2
Lake.....	4	Dawson.....	1
Lewis and Clark.....	11	Deuel.....	—
Liberty.....	—	Dixon.....	—
Lincoln.....	1	Dodge.....	—
McCone.....	—	Douglas.....	63
Madison.....	—	Dundy.....	—
Meagher.....	—	Fillmore.....	1
Mineral.....	—	Franklin.....	1
Missoula.....	2	Frontier.....	1
Musselshell.....	—	Furnas.....	—
Park.....	1	Gage.....	7
Petroleum.....	—	Garden.....	—
Phillips.....	—	Garfield.....	—
Pondera.....	2	Gosper.....	—
Powder River.....	—	Grant.....	—
Powell.....	—	Greeley.....	—
Prairie.....	—	Hall.....	2
Ravalli.....	1	Hamilton.....	1
Richland.....	1	Harlan.....	1
Roosevelt.....	9	Hayes.....	—
Rosebud.....	11	Hitchcock.....	—
Sanders.....	—	Holt.....	2
Sheridan.....	—	Hooker.....	—
Silver Bow.....	33	Howard.....	—
Stillwater.....	—	Jefferson.....	—
Sweet Grass.....	—	Johnson.....	—
Teton.....	—	Kearney.....	3
Toole.....	—	Keith.....	—
Treasure.....	—	Keya Paha.....	—
Valley.....	1	Kimball.....	1
Wheatland.....	—	Knox.....	2
Wibaux.....	1	Lancaster.....	28
Yellowstone.....	7	Lincoln.....	2
		Logan.....	—

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
NEBRASKA—Continued		Cheshire	3
Loup	—	Coos	2
McPherson	—	Grafton	18
Madison	8	Hillsboro	35
Merrick	2	Merrimack	25
Morrill	1	Rockingham	13
Nance	—	Strafford	14
Nemaha	1	Sullivan	3
Nuckolls	—		
Otoe	2	NEW JERSEY:	
Pawnee	—	Total	1,647
Perkins	—	Atlantic	52
Phelps	1	Bergen	89
Pierce	—	Burlington	33
Platte	1	Camden	82
Polk	2	Cape May	17
Red Willow	—	Cumberland	27
Richardson	1	Essex	377
Rock	—	Gloucester	16
Saline	3	Hudson	296
Sarpy	—	Hunterdon	11
Saunders	—	Mercer	127
Scotts Bluff	3	Middlesex	66
Seward	—	Monmouth	89
Sheridan	—	Morris	114
Sherman	—	Ocean	11
Sioux	—	Passaic	95
Stanton	—	Salem	10
Thayer	—	Somerset	27
Thomas	—	Sussex	1
Thurston	5	Union	95
Valley	—	Warren	12
Washington	1		
Wayne	1	NEW MEXICO:	
Webster	—	Total	388
Wheeler	—	Bernalillo	99
York	—	Catron	—
		Chaves	14
NEVADA:		Colfax	7
Total	73	Curry	2
Churchill	2	DeBaca	1
Clark	22	Dona Ana	19
Douglas	—	Eddy	9
Elko	5	Grant	25
Esmeralda	2	Guadalupe	1
Eureka	1	Harding	3
Humboldt	1	Hidalgo	4
Lander	—	Lea	3
Lincoln	3	Lincoln	19
Lyon	—	Luna	5
Mineral	1	McKinley	46
Nye	12	Mora	3
Ormsby	1	Otero	3
Pershing	1	Quay	3
Storey	1	Rio Arriba	6
Washoe	20	Roosevelt	3
White Pine	1	Sandoval	8
		San Juan	20
NEW HAMPSHIRE:		San Miguel	22
Total	116	Santa Fe	28
Belknap	2	Sierra	3
Carroll	1	Socorro	9

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
NEW MEXICO—Continued		Washington	10
Taos	7	Wayne	5
Torrance	4	Westchester	130
Union	4	Wyoming	4
Valencia	8	Yates	1
NEW YORK:		NORTH CAROLINA:	
Total	5,601	Total	1,182
Albany	94	Alamance	13
Allegany	4	Alexander	2
Broome	45	Alleghany	2
Cattaraugus	27	Anson	7
Cayuga	9	Ashe	3
Chautauqua	22	Avery	2
Chemung	17	Beaufort	11
Chenango	3	Bertie	10
Clinton	11	Bladen	4
Columbia	15	Brunswick	3
Cortland	4	Buncombe	129
Delaware	5	Burke	14
Dutchess	128	Cabarrus	7
Erie	423	Caldwell	8
Essex	32	Camden	1
Franklin	71	Cartaret	3
Fulton	9	Caswell	2
Genesee	15	Catawba	3
Greene	4	Chatham	3
Hamilton	1	Cherokee	2
Herkimer	15	Chowan	8
Jefferson	18	Clay	1
Lewis	4	Cleveland	10
Livingston	17	Columbus	7
Madison	7	Craven	17
Monroe	159	Cumberland	27
Montgomery	16	Currituck	3
Nassau	81	Dare	1
New York City	3,254	Davidson	6
Niagara	47	Davie	4
Oneida	98	Duplin	11
Onondaga	88	Durham	33
Ontario	24	Edgecombe	26
Orange	57	Forsyth	47
Orleans	5	Franklin	5
Oswego	11	Gaston	11
Otsego	15	Gates	2
Putnam	4	Graham	3
Rensselaer	46	Granville	12
Rockland	36	Greene	7
St. Lawrence	19	Guilford	44
Saratoga	10	Halifax	21
Schenectady	4	Harnett	10
Schoharie	6	Haywood	4
Schuyler	1	Henderson	7
Seneca	66	Hertford	11
Steuben	19	Hoke	49
Suffolk	271	Hyde	2
Sullivan	17	Iredell	5
Tioga	5	Jackson	2
Tompkins	13	Johnston	15
Ulster	28	Jones	1
Warren	15		

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
NORTH CAROLINA—Con.			
Lee.....	6	Cavalier.....	1
Lenoir.....	11	Dickey.....	1
Lincoln.....	2	Divide.....	2
McDowell.....	2	Dunn.....	2
Macon.....	1	Eddy.....	—
Madison.....	1	Emmons.....	—
Martin.....	14	Foster.....	2
Mecklenburg.....	46	Golden Valley.....	—
Mitchell.....	4	Grand Forks.....	5
Montgomery.....	2	Grant.....	—
Moore.....	2	Griggs.....	—
Nash.....	22	Hettinger.....	—
New Hanover.....	28	Kidder.....	—
Northampton.....	12	La Moure.....	—
Onslow.....	2	Logan.....	1
Orange.....	7	McHenry.....	1
Pamlico.....	4	McIntosh.....	—
Pasquotank.....	9	McKenzie.....	—
Pender.....	5	McLean.....	4
Perquimans.....	2	Mercer.....	—
Person.....	9	Morton.....	1
Pitt.....	36	Mountrail.....	1
Polk.....	—	Nelson.....	1
Randolph.....	4	Oliver.....	—
Richmond.....	10	Pembina.....	1
Robeson.....	21	Pierce.....	2
Rockingham.....	13	Ramsey.....	2
Rowan.....	8	Ransom.....	1
Rutherford.....	9	Renville.....	—
Sampson.....	9	Richland.....	1
Scotland.....	7	Rolette.....	19
Stanly.....	9	Sargent.....	1
Stokes.....	5	Sheridan.....	—
Surry.....	7	Sioux.....	7
Swain.....	6	Slope.....	—
Transylvania.....	3	Stark.....	—
Tyrrell.....	1	Steele.....	—
Union.....	6	Stutsman.....	10
Vance.....	17	Towner.....	1
Wake.....	51	Traill.....	3
Warren.....	3	Walsh.....	5
Washington.....	1	Ward.....	—
Watauga.....	—	Wells.....	4
Wayne.....	79	Williams.....	1
Wilkes.....	5		
Wilson.....	35		
Yadkin.....	2		
Yancey.....	3		
NORTH DAKOTA:			
Total.....	96		
Adams.....	—		
Barnes.....	—		
Benson.....	9		
Billings.....	—		
Bottineau.....	—		
Bowman.....	—		
Burke.....	—		
Burleigh.....	1		
Cass.....	8		
		OHIO:	
		Total.....	2,583
		Adams.....	5
		Allen.....	31
		Ashland.....	3
		Ashtabula.....	15
		Athens.....	19
		Auglaize.....	4
		Belmont.....	13
		Brown.....	8
		Butler.....	72
		Carroll.....	3
		Champaign.....	5
		Clark.....	44
		Clermont.....	9
		Clinton.....	7

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
OHIO—Continued		Shelby.....	4
Columbiana.....	43	Stark.....	153
Coshocton.....	—	Summit.....	110
Crawford.....	6	Trumbull.....	32
Cuyahoga.....	527	Tuscarawas.....	12
Darke.....	9	Union.....	2
Defiance.....	3	Van Wert.....	4
Delaware.....	2	Vinton.....	5
Erie.....	8	Warren.....	9
Fairfield.....	11	Washington.....	9
Fayette.....	3	Wayne.....	16
Franklin.....	182	Williams.....	3
Fulton.....	4	Wood.....	7
Gallia.....	34	Wyandot.....	6
Geauga.....	5		
Greene.....	6		
Guernsey.....	5		
Hamilton.....	335	OKLAHOMA:	
Hancock.....	4	Total.....	708
Hardin.....	6	Adair.....	12
Harrison.....	2	Alfalfa.....	1
Henry.....	4	Atoka.....	4
Highland.....	6	Beaver.....	2
Hocking.....	5	Beckham.....	7
Holmes.....	1	Blaine.....	9
Huron.....	3	Bryan.....	5
Jackson.....	5	Caddo.....	20
Jefferson.....	15	Canadian.....	2
Knox.....	11	Carter.....	9
Lake.....	11	Cherokee.....	12
Lawrence.....	14	Choctaw.....	6
Licking.....	15	Cimarron.....	1
Logan.....	5	Cleveland.....	24
Lorain.....	27	Coal.....	4
Lucas.....	186	Comanche.....	10
Madison.....	12	Cotton.....	—
Mahoning.....	90	Craig.....	12
Marion.....	16	Creek.....	16
Medina.....	3	Custer.....	13
Meigs.....	7	Delaware.....	4
Mercer.....	5	Dewey.....	1
Miami.....	8	Ellis.....	—
Monroe.....	1	Garfield.....	19
Montgomery.....	169	Garvin.....	10
Morgan.....	11	Grady.....	8
Morrow.....	1	Grant.....	2
Muskingum.....	16	Greer.....	2
Noble.....	—	Harmon.....	2
Ottawa.....	5	Harper.....	—
Paulding.....	2	Haskell.....	6
Perry.....	3	Hughes.....	8
Pickaway.....	25	Jackson.....	4
Pike.....	5	Jefferson.....	3
Portage.....	4	Johnston.....	6
Preble.....	1	Kay.....	8
Putnam.....	4	Kingfisher.....	4
Richland.....	20	Kiowa.....	5
Ross.....	24	Latimer.....	13
Sandusky.....	9	Le Flore.....	9
Scioto.....	23	Lincoln.....	4
Seneca.....	6	Logan.....	7
		Love.....	1

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
OKLAHOMA—Continued		Marion	53
McClain	2	Morrow	—
McCurtain	15	Multnomah	134
McIntosh	11	Polk	4
Major	1	Sherman	—
Marshall	2	Tillamook	—
Mayes	7	Umatilla	8
Murray	4	Union	2
Muskogee	47	Walla	2
Noble	4	Wasco	8
Nowata	2	Washington	4
Okfuskee	12	Wheeler	—
Oklahoma	62	Yamhill	4
Oklmulgee	17		
Osage	8	PENNSYLVANIA:	
Ottawa	39	Total	3, 697
Pawnee	3	Adams	2
Payne	7	Allegheny	556
Pittsburg	16	Armstrong	16
Pontotoc	10	Beaver	43
Pottawatomie	14	Bedford	5
Pushmataha	2	Berks	115
Roger Mills	3	Blair	22
Rogers	4	Bradford	9
Seminole	6	Bucks	27
Sequoyah	12	Butler	6
Stephens	7	Cambria	97
Texas	—	Cameron	1
Tillman	4	Carbon	20
Tulsa	55	Centre	5
Wagoner	7	Chester	84
Washington	4	Clarion	3
Washita	5	Clearfield	12
Woods	1	Clinton	8
Woodward	20	Columbia	14
		Crawford	12
OREGON:		Cumberland	15
Total	311	Dauphin	90
Baker	7	Delaware	105
Benton	4	Elk	4
Clackamas	14	Erie	70
Clatsop	5	Fayette	52
Columbia	5	Forest	1
Coos	8	Franklin	62
Crook	—	Fulton	—
Curry	—	Greene	12
Deshutes	2	Huntingdon	13
Douglas	4	Indiana	15
Gilliam	—	Jefferson	3
Grant	1	Juniata	6
Harney	—	Lackawanna	112
Hood River	—	Lancaster	54
Jackson	6	Lawrence	11
Jefferson	2	Lebanon	9
Josephine	3	Lehigh	47
Klamath	13	Lucerne	146
Lake	—	Lycoming	13
Lane	13	McKean	11
Lincoln	—	Mercer	25
Linn	3	Mifflin	9
Malheur	2	Monroe	4

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
PENNSYLVANIA—Con.			
Montgomery	131	Kershaw	7
Montour	19	Lancaster	7
Northampton	49	Laurens	5
Northumberland	35	Lee	7
Perry	1	Lexington	9
Philadelphia	1, 127	McCormick	2
Pike		Marion	9
Potter	2	Marlboro	8
Schuylkill	85	Newberry	7
Snyder	10	Oconee	6
Somerset	14	Orangeburg	14
Sullivan		Pickens	2
Susquehanna	11	Richland	95
Tioga	4	Saluda	2
Union	7	Spartanburg	32
Venango	30	Sumter	26
Warren	18	Union	7
Washington	40	Williamsburg	15
Wayne	27	York	9
Westmoreland	98		
Wyoming	5		
York	38		
RHODE ISLAND:		SOUTH DAKOTA:	
Total	232	Total	172
Bristol	9	Armstrong	
Kent	12	Aurora	
Newport	16	Beadle	4
Providence	189	Bennett	
Washington	6	Bon Homme	
		Brookings	2
		Brown	2
		Brule	1
		Buffalo	5
		Butte	3
		Campbell	
		Charles Mix	4
		Clark	
		Clay	1
		Codington	1
		Corson	2
		Custer	4
		Davison	2
		Day	
		Deuel	1
		Dewey	5
		Douglas	1
		Edmunds	
		Fall River	11
		Faulk	1
		Grant	
		Gregory	1
		Haakon	1
		Hamlin	
		Hand	
		Hanson	1
		Harding	
		Hughes	5
		Hutchinson	
		Hyde	2
		Jackson	
		Jerauld	
		Jones	1
		Kingsbury	2
		Lake	
SOUTH CAROLINA:			
Total	562		
Abbeville	5		
Aiken	13		
Allendale	3		
Anderson	12		
Bamberg	6		
Barnwell	3		
Beaufort	13		
Berkeley	4		
Calhoun	2		
Charleston	53		
Cherokee	6		
Chester	8		
Chesterfield	8		
Clarendon	5		
Colleton	13		
Darlington	12		
Dillon	6		
Dorchester	7		
Edgefield	1		
Fairfield	3		
Florence	38		
Georgetown	9		
Greenville	36		
Greenwood	4		
Hampton	7		
Horry	15		
Jasper	1		

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
SOUTH DAKOTA—Con.			
Lawrence	8	Greene	22
Lincoln	1	Grundy	4
Lyman	1	Hamblen	17
McCook		Hamilton	133
McPherson		Hancock	10
Marshall	2	Hardeman	27
Meade	1	Hardin	9
Mellette	6	Hawkins	14
Miner		Haywood	26
Minnehaha	7	Henderson	6
Moody		Henry	14
Pennington	17	Hickman	7
Perkins		Houston	6
Potter		Humphreys	6
Roberts	8	Jackson	12
Sanborn	1	Jefferson	14
Shannon	15	Johnson	2
Spink	10	Knox	98
Stanley		Lake	3
Sully		Lauderdale	13
Todd	13	Lawrence	13
Tripp	1	Lewis	3
Turner	2	Lincoln	15
Union		Loudon	12
Walworth		McMinn	13
Washabaugh	2	McNairy	7
Washington	1	Macon	13
Yankton	9	Madison	33
Ziebach	4	Marion	5
		Marshall	14
		Mauzy	14
		Meigs	2
		Monroe	19
		Montgomery	18
		Moore	
		Morgan	4
		Obion	9
		Overton	8
		Perry	4
		Pickett	2
		Polk	7
		Putnam	17
		Rhea	9
		Roane	15
		Robertson	17
		Rutherford	12
		Scott	6
		Sequatchie	2
		Sevier	9
		Shelby	227
		Smith	10
		Stewart	5
		Sullivan	25
		Sumner	19
		Tipton	2
		Trousdale	4
		Unicoi	4
		Union	2
		Van Buren	
		Warren	13
		Washington	24
		Wayne	11
TENNESSEE:			
Total	1, 631		
Anderson	9		
Bedford	8		
Benton	5		
Bledsoe	2		
Blount	24		
Bradley	18		
Campbell	21		
Cannon	4		
Carroll	13		
Carter	11		
Cheatham	6		
Chester	4		
Claiborne	14		
Clay	3		
Cocke	18		
Coffee	17		
Crockett	6		
Cumberland	3		
Davidson	176		
Decatur	6		
De Kalb	14		
Dickson	23		
Dyer	10		
Fayette	5		
Fentress	5		
Franklin	12		
Gibson	19		
Giles	15		
Grainger	17		

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
TENNESSEE—Continued		Crosby	
Weakley	17	Culberson	
White	14	Dallam	1
Williamson	9	Dallas	172
Wilson	12	Dawson	3
TEXAS:		Deaf Smith	
Total	2, 923	Delta	
Anderson	14	Denton	6
Andrews	1	De Witt	10
Angelina	9	Dickens	1
Aransas	2	Dimmit	10
Archer	1	Donley	2
Armstrong	1	Duval	15
Atascosa	14	Eastland	9
Austin	3	Ector	7
Bailey		Edwards	
Bandera	3	Ellis	17
Bastrop	6	El Paso	120
Baylor		Erath	7
Bee	12	Falls	13
Bell	17	Fannin	2
Bexar	352	Fayette	2
Blanco		Fisher	3
Borden		Floyd	
Bosque	5	Foard	1
Bowie	15	Fort Bend	20
Brazoria	11	Franklin	1
Brazos	10	Freestone	10
Brewster	6	Frio	9
Briscoe	1	Gaines	1
Brooks	5	Galveston	40
Brown	4	Garza	2
Burleson	7	Gillespie	2
Burnet	4	Glasscock	
Caldwell	23	Goliad	6
Calhoun	5	Gonzales	17
Callahan	4	Gray	1
Cameron	74	Grayson	8
Camp	5	Gregg	17
Carson	1	Grimes	3
Cass	10	Guadalupe	10
Castro		Hale	3
Chambers		Hall	
Cherokee	50	Hamilton	1
Childress	2	Hansford	
Clay	2	Hardeman	1
Cochran		Hardin	4
Coke	1	Harris	283
Coleman	2	Harrison	16
Collin	15	Hartley	2
Collingsworth	3	Haskell	1
Colorado	3	Hays	11
Comal	11	Hemphill	1
Comanche	3	Henderson	8
Concho	3	Hidalgo	122
Cooke	1	Hill	6
Coryell	4	Hockley	1
Cottle		Hood	1
Crane		Hopkins	3
Crockett		Houston	8
		Howard	9

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
TEXAS—Continued		Navarro	6
Hudspeth		Newton	1
Hunt	3	Nolan	5
Hutchinson	3	Nueces	77
Irion		Ochiltree	
Jack	1	Oldham	
Jackson	4	Orange	4
Jasper	4	Palo Pinto	4
Jeff Davis	1	Panola	5
Jefferson	68	Parker	4
Jim Hogg	4	Parmer	1
Jim Wells	11	Pecos	5
Johnson	7	Polk	4
Jones	4	Potter	12
Karnes	13	Presidio	3
Kaufman	32	Rains	
Kendall	4	Randall	
Kenedy	3	Reagan	1
Kent	1	Real	
Kerr	50	Red River	8
Kimble	1	Reeves	1
King		Refugio	2
Kinney		Roberts	
Kleberg	8	Robertson	8
Knox	1	Rockwall	1
Lamar	11	Runnels	2
Lamb	1	Rusk	10
Lampasas	5	Sabine	
La Salle	5	San Augustine	
Lavaca	7	San Jacinto	1
Lee	2	San Patricio	29
Leon	3	San Saba	2
Liberty	7	Schleicher	
Limestone	8	Scurry	1
Lipscomb	1	Shackelford	1
Live Oak	3	Shelby	6
Llano	2	Sherman	
Loving		Smith	19
Lubbock	12	Somervell	2
Lynn	1	Starr	7
McCulloch	5	Stephens	3
McLennan	43	Sterling	1
McMullen		Stonewall	
Madison	4	Sutton	2
Marion	4	Swisher	1
Martin	1	Tarrant	93
Mason	3	Taylor	29
Matagorda	5	Terrell	
Maverick	10	Terry	1
Medina	15	Throckmorton	1
Menard	1	Titus	3
Midland	2	Tom Green	33
Milam	17	Travis	78
Mills		Trinity	3
Mitchell	5	Tyler	4
Montague	2	Upshur	10
Montgomery	6	Upton	1
Moore		Uvalde	14
Morris	3	Val Verde	14
Motley		Van Zandt	8
Nacodoches	9	Victoria	10

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
TEXAS—Continued		Grand Isle.....	—
Walker.....	6	Lamoille.....	2
Waller.....	5	Orange.....	2
Ward.....	2	Orleans.....	2
Washington.....	9	Rutland.....	25
Webb.....	42	Washington.....	52
Wharton.....	11	Windham.....	7
Wheeler.....	1	Windsor.....	6
Wichita.....	37		
Wilbarger.....	6	VIRGINIA:	
Willacy.....	18	Total.....	1, 300
Williamson.....	22	Accomac.....	19
Wilson.....	18	Albemarle.....	14
Winkler.....	2	Alleghany.....	8
Wise.....	3	Amelia.....	4
Wood.....	6	Amherst.....	10
Yoakum.....	—	Appomattox.....	—
Young.....	3	Arlington.....	18
Zapata.....	1	Augusta.....	16
Zavala.....	10	Bath.....	1
		Bedford.....	4
UTAH:		Bland.....	2
Total.....	83	Botetourt.....	3
Beaver.....	—	Brunswick.....	7
Box Elder.....	—	Buchanan.....	8
Cache.....	2	Buckingham.....	3
Carbon.....	2	Campbell.....	3
Daggett.....	—	Caroline.....	5
Davis.....	2	Carroll.....	4
Duchesne.....	1	Charles City.....	4
Emery.....	—	Charlotte.....	7
Garfield.....	—	Chesterfield.....	19
Grand.....	—	Clarke.....	3
Iron.....	—	Craig.....	2
Juab.....	—	Culpeper.....	2
Kane.....	—	Cumberland.....	2
Millard.....	2	Dickenson.....	4
Morgan.....	—	Djinnwiddie.....	59
Piute.....	—	Elizabeth City.....	13
Rich.....	—	Essex.....	—
Salt Lake.....	39	Fairfax.....	9
San Juan.....	3	Fauquier.....	8
Sanpete.....	1	Floyd.....	5
Sevier.....	—	Fluvanna.....	—
Summit.....	3	Franklin.....	8
Tooele.....	1	Frederick.....	5
Uintah.....	1	Giles.....	3
Utah.....	8	Gloucester.....	5
Wasatch.....	—	Goochland.....	12
Washington.....	—	Grayson.....	6
Wayne.....	—	Greene.....	2
Weber.....	18	Greensville.....	8
		Halifax.....	14
VERMONT:		Hanover.....	9
Total.....	129	Henrico.....	9
Addison.....	1	Henry.....	9
Bennington.....	8	Highland.....	1
Caledonia.....	6	Isle of Wight.....	9
Chittenden.....	12	James City.....	3
Essex.....	1	King and Queen.....	7
Franklin.....	5	King George.....	2

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
VIRGINIA—Continued		Harrisonburg	6
King William	5	Hopewell	4
Lancaster	4	Lynchburg	15
Lee	19	Martinsville	4
Loudoun	6	Newport News	26
Louisa	6	Norfolk	64
Lunenburg	5	Petersburg	25
Madison	1	Portsmouth	31
Mathews	2	Radford	1
Mecklenburg	11	Richmond	122
Middlesex		Roanoke	30
Montgomery	11	South Norfolk	4
Nansemond	21	Staunton	29
Nelson	2	Suffolk	12
New Kent	1	Williamsburg	29
Norfolk	20	Winchester	2
Northampton	10		
Northumberland	2	WASHINGTON:	
Nottoway	26	Total	738
Orange	5	Adams	1
Page	4	Asotin	1
Patrick	1	Benton	3
Pittsylvania	22	Chelan	9
Powhatan		Clallam	9
Prince Edward	2	Clark	27
Prince George	7	Columbia	
Princess Anne	48	Cowlitz	11
Prince William	2	Douglas	1
Pulaski	13	Ferry	
Rappahannock	2	Franklin	1
Richmond	6	Garfield	2
Roanoke	23	Grant	2
Rockbridge	11	Grays Harbor	22
Rockingham	10	Island	3
Russell	4	Jefferson	2
Scott	16	King	250
Shenandoah	9	Kitsap	25
Smyth	18	Kittitas	1
Southampton	18	Klickitat	1
Spotsylvania	4	Lewis	8
Stafford	1	Lincoln	
Surry	5	Mason	5
Sussex	9	Okanogan	4
Tazewell	15	Pacific	5
Warren	2	Pend Oreille	
Warwick	3	Pierce	118
Washington	10	San Juan	
Westmoreland	8	Skagit	46
Wise	23	Skamania	
Wythe	4	Snohomish	27
York	2	Spokane	66
INDEPENDENT CITIES:²		Stevens	1
Alexandria	13	Thurston	6
Bristol	8	Wahkiakum	
Buena Vista	3	Walla Walla	27
Charlottesville	15	Whatcom	16
Clifton Forge	2	Whitman	3
Danville	9	Yakima	35
Fredericksburg	4		
Hampton	5		

² These cities are independent, each having the same status as a county.

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
WEST VIRGINIA:			
Total	718	Ashland	11
Barbour	8	Barron	8
Berkeley	9	Bayfield	2
Boone	8	Bröwh	13
Braxton	4	Buffalo	1
Brooke	6	Burnett	2
Cabell	68	Calumet	1
Calhoun	2	Chippewa	12
Clay	1	Clark	6
Doddridge		Columbia	8
Fayette	40	Crawford	2
Gilmer	3	Dane	23
Grant	1	Dodge	7
Greenbrier	16	Door	4
Hampshire	4	Douglas	25
Hancock	12	Dunn	2
Hardy	3	Eau Claire	5
Harrison	22	Florence	1
Jackson	3	Fond du Lac	8
Jefferson	7	Forest	
Kanawha	76	Grant	3
Lewis	41	Green	2
Lincoln	4	Green Lake	
Logan	45	Iowa	6
McDowell	30	Iron	5
Marion	18	Jackson	3
Marshall	6	Jefferson	9
Mason	8	Juneau	1
Mercer	26	Kenosha	9
Mineral	9	Kewaunee	4
Mingo	13	La Crosse	10
Monongalia	7	Lafayette	1
Monroe	5	Langlade	2
Morgan	6	Lincoln	2
Nicholas	2	Manitowoc	18
Ohio	20	Marathon	3
Pendleton	6	Marinette	7
Pleasants	1	Marquette	
Pocahontas	7	Milwaukee	248
Preston	18	Monroe	9
Putnam	4	Oconto	4
Raleigh	38	Oneida	1
Randolph	14	Outagamie	10
Ritchie	1	Ozaukee	2
Roane	19	Pepin	1
Summers	8	Pierce	1
Taylor	5	Polk	3
Tucker	2	Portage	6
Tyler	3	Price	5
Upshur	3	Racine	19
Wayne	11	Richland	1
Webster	2	Rock	13
Wetzel	3	Rusk	1
Wirt	3	St. Croix	6
Wood	21	Sauk	4
Wyoming	16	Sawyer	5
		Shawano	6
		Sheboygan	25
		Taylor	1
		Trempealeau	4
		Vernon	1
WISCONSIN:			
Total	648		
Adams			

Tuberculosis Deaths—Continued

County	Number of deaths	County	Number of deaths
WISCONSIN—Continued		Fremont.....	5
Vilas.....	2	Goshen.....	—
Walworth.....	8	Hot Springs.....	—
Washburn.....	1	Johnson.....	—
Washington.....	2	Laramie.....	7
Waukesha.....	15	Lincoln.....	1
Waupaca.....	6	Natrona.....	1
Waushara.....	4	Niobrara.....	—
Winnebago.....	4	Park.....	—
Wood.....	4	Platte.....	—
WYOMING:		Sheridan.....	2
Total	28	Sublette.....	—
Albany.....	1	Sweetwater.....	4
Big Horn.....	4	Teton.....	—
Campbell.....	—	Uinta.....	1
Carbon.....	1	Washakie.....	1
Converse.....	—	Weston.....	—
Crook.....	—	Yellowstone National Park.....	—

Enhancement of Growth of a Strain of *M. Tuberculosis* (Var. *Hominis*) by Streptomycin¹

(Submitted for publication June, 1948)

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Although the development of resistance to streptomycin by tubercle bacilli has been noted frequently, no strains which require this antibiotic for growth have been reported. A strain of *Mycobacterium tuberculosis* (var. *hominis*), the growth of which is markedly enhanced by the presence of streptomycin in the culture medium, is described here.

The organism was isolated from the sputum of a patient with pulmonary tuberculosis on the 96th day of his therapy with this drug. The principal features of the patient's illness are as follows:

F. S., a 33-year old white male, was admitted to Lawson Veterans' Administration Hospital on September 25, 1947, with symptoms of cough, fatigue and weight loss dating from March 1947. One hemoptysis occurred just prior to admission. X-ray findings were consistent with moderately advanced tuber-

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culosis, and sputum culture was positive for tubercle bacilli. Secondary infection of his cavities was satisfactorily controlled by penicillin therapy and frequent bronchoscopic drainages. He became afebrile on October 29.

Because of persistently positive sputum and some slight spread of his disease as demonstrated by X-ray, streptomycin therapy in dosage of 0.5 gm. every 12 hours was commenced on December 12, 1947. No improvement in his clinical course was noted after therapy was begun, and his sputum cultures remained positive. On February 27, X-ray showed further spread in the left lower lobe. On March 13, hemoptysis occurred and has since continued intermittently in spite of induction of pneumoperitoneum. On March 14, he again became febrile.

It was the impression of observers that his course was down-hill, and on April 5 it was even suggested that streptomycin be discontinued in view of his persistently positive sputum, and because of the possibility that the drug might actually be causing a spread of his disease. However, the full 4 months' therapy was continued through April 12. No striking change has been noted since that time.

During the routine streptomycin sensitivity testing of the strain of tubercle bacillus isolated from the sputum specimen of March 18, 1948, it was noted that growth was poor in the control tube, while it was abundant in all tubes which contained streptomycin (1 μ g., 5 μ g., 10 μ g., 100 μ g., and 1,000 μ g. per ml.). This was observed in both Dubos and Davis (1) liquid medium, and on Lowenstein-Jensen (2) solid egg medium.

This characteristic was again observed when the strain was tested in Dubos culture media (10 percent plasma used in place of albumin) to which 1, 5, 10, 100, and 1,000 μ g. of streptomycin per ml. had been added. In the Dubos liquid medium containing 10 μ g. per ml. of streptomycin, growth was apparent after 3 days' incubation, whereas no growth was evident in the control tube without streptomycin. After 5 days, growth was abundant in 1, 10, and 100 μ g. of streptomycin per ml., whereas growth was barely visible in the control tube. Growth was not as abundant in 1,000 μ g. of streptomycin per ml. as in the other tubes, although by comparison with the control tube it was luxuriant. Since the second transfer of this strain of tubercle bacillus on Dubos medium with graded amounts of streptomycin, we have been successful in reduplicating this finding in five of seven trials. We do not completely understand the cause of this inconsistency but offer the two following possibilities: (a) The culture with which we are dealing is a mixture of strains, or (b) unknown variables such as differences in lots of culture media and streptomycin may have altered the finding.

Comment

The paradox of dependency of strains of bacteria on an antibiotic which usually inhibits their growth has been described in connection with other bacteria. Miller and Bohnhoff (3) reported strains of meningococci which required streptomycin for reproduction both *in vivo* and *in vitro*. More recently Yegian and Budd (5) reported

the same phenomenon in a variant of *Mycobacterium ranae*. Paine and Finland (6) observed variants of *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Proteus morganii*, which were sensitive, dependent, or resistant to streptomycin.

Although not totally dependent upon streptomycin, the strain which we are reporting exhibits characteristics of partial dependency. So far as we are aware this phenomenon has not previously been observed in a strain of *M. tuberculosis* isolated from a human source. It is perhaps significant, in view of the cultural findings, that the condition of the patient became worse during the latter half of his course of streptomycin therapy. In view of the variability in clinical tuberculosis, no positive conclusion of cause-and-effect relationship seems warranted. It is unfortunate that streptomycin sensitivity on the culture of *M. tuberculosis* isolated from the patient's sputum before beginning therapy was not performed and therefore cannot be compared with that isolated on the 96th day of therapy.

Experiments designed to evaluate the effect of streptomycin on the course of experimental tuberculosis produced by this organism are now in progress, and studies on its metabolism will be undertaken.

Summary

A strain of *Mycobacterium tuberculosis*, growth of which is markedly enhanced by the presence of streptomycin in the culture medium, has been isolated from the sputum of a patient who had received this antibiotic for treatment of pulmonary tuberculosis. The patient's infection exhibited rapid progression during the course of streptomycin therapy.

NOTE: Since the submission of this paper, a second sputum specimen obtained from this patient on July 6, 1948, has yielded tubercle bacilli which have displayed the same characteristics, i. e., on solid medium (Lowenstein-Jensen) growth was obtained on slants containing 1, 10, 100 μ g. of streptomycin, whereas no growth was evident on the medium without streptomycin.

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- (3) Miller, C. P., and Bohnhoff, M.: Development of streptomycin-resistant variants of meningococcus. *Science*, **105**: 620 (1947).
- (4) Alexander, H. E., and Leidy, G.: Mode of action of streptomycin on type bh Influenzae. *J. Exp. Med.* **85**: 329 (1947).
- (5) Yegian, D., and Budd, V.: A variant of *Mycobacterium ranae* requiring streptomycin for growth. *J. Bact.* **55**: 459 (1948).
- (6) Paine, T. F., and Finland, M.: Streptomycin-sensitive, -dependent, and -resistant bacteria. *Science*, **107**: 143 (1948).

—ANNOUNCEMENT—

Courses in Laboratory Diagnosis of Tuberculosis

A 2-week course for laboratory directors, senior staff members, and physicians in the laboratory diagnosis of tuberculosis will be given October 4-15 at the Laboratory Division of the Communicable Disease Center. In addition, a 4-week course for laboratory personnel in the laboratory diagnosis of tuberculosis will be offered November 15 to December 10.

Tentative outline for the 2-week course.—The course is designed for laboratory directors, senior laboratory staff members, physicians and other supervising personnel. It consists of demonstrations, lectures and round-table discussions, supplemented by laboratory exercises.

Phases of the program and relative amounts of time allotted to each is as follows:

1. Laboratory personnel protection.....	} 2 days
2. Culture media preparation.....	
3. Microscopy techniques.....	} 2 days
4. Interpretation of results and reporting.....	
5. Culture techniques.....	} 2 days
6. Digestion and concentration.....	
7. Culture diagnosis.....	2 days
8. Animal inoculation and autopsy.....	1 day
9. Streptomycin assays.....	} 1 day
10. Evaluation studies.....	

Tentative outline for the 4-week course.—The course is essentially practical laboratory training, enabling the students to carry out the various procedures themselves to insure proficiency. It is supplemented by lectures and demonstrations.

Phases of the program and relative amount of time allotted to each is as follows:

1. Preparation of culture media: Practice in making the commonly used diagnostic and research media.....	2 days
2. Microscopic techniques: Training in preparation of smears and stains. Interpretation of findings. Fluorescent microscopy.....	2 days
3. Culture techniques: Training in preparation of cultures. Digestion and concentration methods. Particular emphasis on interpretation of findings. Includes training in identification of types of organisms and their colony morphology.....	13 days
4. Animal experimentation: Training in techniques of inoculation and autopsy of mice, guinea pigs and rabbits. Tuberculin testing of animals.....	3 days

This training is open to all grades of employed laboratory personnel. Although first consideration will be given to the laboratories of State and local public health departments, applicants from hospitals and

private laboratories will be considered when vacancies occur. Laboratory directors and senior staff members wishing to attend the 4-week course may do so.

There is no tuition or laboratory fee, but travel and living expenses must be paid for by the individual or his employer.

It is desirable that students be tuberculin-positive. Tuberculin-negative individuals coming for the training will assume all responsibility of possible conversion to tuberculin positivity.

Applications should be sent to Seward E. Miller, Senior Surgeon, Chief of the Laboratory Division, Communicable Disease Center, 291 Peachtree Street, Atlanta, Ga., and should be made as far in advance as possible. Notification of acceptance from this office will be made in sufficient time to allow the students to arrange for living accommodations. It is suggested that trainees obtain reservations for living accommodations at the earliest possible date. A list of hotels and rooming houses will be sent to applicants at the time of acceptance.

Notice

A limited number of copies of the INDEX OF HOSPITALS AND SANATORIA WITH TUBERCULOSIS BEDS IN THE UNITED STATES AND TERRITORIES AS OF JANUARY 1, 1948, is available and may be obtained by writing to the Tuberculosis Control Division, Public Health Service, Washington 25, D. C.

DEATHS DURING WEEK ENDED AUG 7, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Aug. 7, 1948	Correspond- ing week, 1947
Data for 93 large cities of the United States:		
Total deaths.....	8,216	8,851
Median for 3 prior years.....	7,919	
Total deaths, first 32 weeks of year.....	301,075	301,332
Deaths under 1 year of age.....	671	700
Median for 3 prior years.....	668	
Deaths under 1 year of age, first 32 weeks of year.....	21,496	24,126
Data from industrial insurance companies:		
Policies in force.....	70,971,293	67,226,670
Number of death claims.....	11,692	10,617
Death claims per 1,000 policies in force, annual rate.....	8.6	8.2
Death claims per 1,000 policies, first 32 weeks of year, annual rate.....	9.6	9.6

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 14, 1948

Summary

The incidence of poliomyelitis increased from 1,239 cases reported last week to 1,409 for the current week, as compared with an increase for the same week in 1946 from 1,284 to 1,575. The comparable 5-year (1943-47) medians are 474 and 701, reported for the respective weeks of 1945. For the current week, 16 of the 27 States reporting more than 10 cases showed an increase of 218 cases (to a combined total of 1,036), while 10 showed a decrease from 281 to 242, and 1 State showed no change. The 18 States reporting currently more than 18 cases are as follows (last week's figures in parentheses): *Increases*—Massachusetts 20 (10), New Jersey 40 (32), Pennsylvania 52 (29), Ohio 82 (57), Illinois 60 (57), Michigan 41 (28), Wisconsin 26 (15), Nebraska 34 (29), Iowa 36 (34), Virginia 52 (36), North Carolina 192 (179), South Carolina 31 (26), Oklahoma 28 (23), Texas 90 (81), California 241 (177); *decreases*—New York 59 (65), Minnesota 57 (63), Tennessee 27 (31). In 1946 the peak of reported incidence of the disease occurred in the week ended August 17 with a report of 1,816 cases. In no other year has the peak been recorded so early since 1934, in which year it was reached in the week ended June 23, with a report of 376 cases, 340 of which occurred in California. The total this year since March 20 (approximate average date of seasonal low incidence) is 8,086, as compared with 6,558 for the corresponding period of 1946 and a 5-year median of 3,217.

Of 29 cases of Rocky Mountain spotted fever reported for the week (last week 38, 5-year median 29), 18 occurred in the South Atlantic area, 3 in Missouri, 2 in Alabama, and 1 each in Illinois, Wisconsin, Louisiana, Montana, and Colorado. One case of smallpox was reported, in Kentucky, and 1 case of psittacosis, in Michigan.

Deaths recorded during the week in 93 large cities in the United States totaled 7,904, as compared with 8,216 last week, 8,835 and 7,673 respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945-47) median of 7,673. The total for the year to date is 308,979, as compared with 310,167 in 1947. Infant deaths totaled 617, as compared with 671 last week and a 3-year median of 679. The cumulative figure is 22,113, as compared with 24,805 for the corresponding period last year.

Telegraphic case reports from State health officers for week ended August 14, 1948

[Leaders indicate that no cases were reported]

Division and State	Diphtheria	Encephalitis, infectious	Measles	Menigitis, meningococcal	Polio-myelitis	Rocky Mountain spotted fever	Scarlet fever	Tularemia	Typhoid; paratyphoid fever ^c	Whooping cough
NEW ENGLAND										
Maine	1		44	1	1		5		2	1
New Hampshire			1		2					1
Vermont			35		2		3			12
Massachusetts	6		129	1	20		15		2	40
Rhode Island							1			
Connecticut			27		10		9			7
MIDDLE ATLANTIC										
New York	8	1	214	5	59		^b 29		5	122
New Jersey			165	4	40		11		1	54
Pennsylvania	7	1	91	4	52		19		7	54
EAST NORTH CENTRAL										
Ohio	3		54	2	82		42	2	5	47
Indiana	2		1		16		5		2	13
Illinois	1	2	24	3	60	1	20		2	41
Michigan ^a		1	134		41		22		3	28
Wisconsin			177		26	1	8		1	54
WEST NORTH CENTRAL										
Minnesota	3		3	1	57	1	8		3	10
Iowa			14		36		4			6
Missouri	1		3		11	3	2		7	9
North Dakota		5	8		8		1			2
South Dakota			43		10		2			
Nebraska			3		34		4			
Kansas			3	2	9		3			14
SOUTH ATLANTIC										
Delaware			2		11		1			
Maryland ^a			70	1	2	7	2			22
District of Columbia			1	1	7		7			4
Virginia	5		56		¹ 52	6	5	2	3	35
West Virginia	6			2	15		2		5	12
North Carolina	24		12	1	192	3	9		3	35
South Carolina	9	1	14		31		3		1	37
Georgia	10		4	1	17	2	4		5	20
Florida	4		12		13		1		5	6
EAST SOUTH CENTRAL										
Kentucky	1		4	2	9		9		4	3
Tennessee	1	1	7	2	27		11		7	16
Alabama	8		3		13	2	4	1	2	11
Mississippi ^a	4		7	1	11		3		2	
WEST SOUTH CENTRAL										
Arkansas	1		7		10		21	5	4	3
Louisiana	1		4		4	1	3			2
Oklahoma	1		10	1	28		2		3	5
Texas	19		107	5	90		7	2	14	93
MOUNTAIN										
Montana			7		3	1	5		1	2
Idaho			5		6		^e 7	1	1	9
Wyoming			3	2	5		2	5		4
Colorado			150	1	6	1			3	26
New Mexico			10		7		1			10
Arizona			9		6					18
Utah ^a	3		37		6			4		15
Nevada										2
PACIFIC										
Washington	7		45		12		7			5
Oregon	2		43	1	9		7			35
California	6	3	171	1	241		19		5	57
Total	144	15	1,973	45	11,409	29	355	22	108	1,002
Median, 1943-47	195	21	1,139	93	701	29	600	16	161	2,744
Year to date, 32 weeks	5,187	309	547,953	2,223	18,437	385	55,616	641	2,066	56,551
Median, 1943-47	7,053	361	535,598	6,097	3,614	348	96,896	579	2,625	82,149
Seasonal low week ends	July		Sept.	Sept.	Mar.		Aug.		Mar.	Oct.
	10		4	18	20		14		20	2
Since seasonal low week	577		582,899	3,005	8,087		78,155		1,593	87,817
Median, 1943-47	864		573,611	8,549	3,217		135,187		2,001	104,196

^a Period ended earlier than Saturday.

^b Including cases reported as streptococcal infections and septic sore throat.

^c Including cases reported separately as paratyphoid fever and salmonella infections, as follows: Massachusetts (salmonella infection) 1; New York (salmonella infection) 3; Ohio 1; Michigan (salmonella infection) 1; Virginia 1; Georgia 2; Florida 1; Kentucky 1; Mississippi 2; Texas 1; Montana 1; Colorado 1; California 3.

¹ Correction—Polio-myelitis, Virginia deducted: July 6 cases and August 3 cases.

Alaska: Polio-myelitis 1. Territory of Hawaii: Measles 6; Paratyphoid fever 1; Whooping cough 14.

PLAGUE INFECTION IN CALIFORNIA AND NEW MEXICO

Plague infection has been reported proved in ectoparasites of rodents collected in California and New Mexico, as follows:

CALIFORNIA

Mono County.—Under date of August 4, in 2 pools of fleas from ground squirrels, *Citellus beldingi*, as follows: Proved positive on July 23, a pool of 71 fleas from 62 ground squirrels taken at the town of Bodie; and proved positive July 22, a pool of 29 fleas from 22 ground squirrels taken at Lundy Lake, 5 miles west and 6 miles north of Leevining.

NEW MEXICO

Rio Arriba County.—Under date of August 11, a pool of 33 lice from 4 marmots, *Marmota flaviventris*, shot July 28 on a ranch approximately 38 miles southwest of Antonito, Colo., via the Nutritas River road.

(NOTE: The inoculation of 19 fleas and of 5 ticks secured from the same animal failed to infect the test animals.)

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—June 1948.—During the month of June 1948, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence ¹									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox.....	2		1						3	
Diphtheria.....	1						1		2	
Dysentery:										
Amebic.....	3				2		3		8	
Bacillary.....	1				1				2	
Hepatitis, infectious.....							1		1	
Malaria ²	2		5		32		178	2	217	2
Measles.....	3				2		1		6	
Meningitis, meningococcus.....			2		4				6	
Mumps.....	1				1		1		3	
Paratyphoid fever.....			1	1	1				2	1
Pneumonia.....		7			8			7	15	14
Poliomyelitis.....							1		1	
Relapsing fever.....							1		1	
Tuberculosis.....		14		6	2	1		7	12	28
Typhoid fever.....							1		1	
Whooping cough.....					1			1	1	1

¹ If place of infection is known, cases are so listed instead of by residence.

² Three recurrent cases.

³ In the Canal Zone only.

Virgin Islands of the United States

Notifiable diseases—April–June 1948.—During the months of April, May, and June 1948, cases of certain notifiable diseases were reported in the Virgin Islands of the United States as follows:

Disease	April	May	June
Cancer.....			1
Chickenpox.....		3	3
Filariasis.....	2	4	
Gonorrhea.....	9	16	21
Hookworm disease.....	2	3	1
Influenza.....		1	
Measles.....		1	3
Mumps.....	15	6	5
Pellagra.....		3	1
Syphilis.....	9	8	23
Tuberculosis, pulmonary.....			1
Typhoid fever.....	1		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—During the week ended July 24, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox.....		29		49	125	34	19	40	39	335
Diphtheria.....			1	7				3	1	12
German measles.....				6	5		1	4	4	20
Influenza.....		5			5					10
Measles.....		6	2	49	159	15		49	28	308
Meningitis, meningococcus.....					1					1
Mumps.....		9		16	68	16	13	17	3	142
Poliomyelitis.....	1		1	1	15	2	1	15	9	45
Scarlet fever.....		1	1	24	13	6		2		47
Tuberculosis (all forms).....		11	5	86	32	42	14	6	29	225
Typhoid and paratyphoid fever.....				3		1			7	11
Undulant fever.....				1	1				2	4
Veneral diseases:										
Gonorrhea.....		7	8	84	86	32	18	30	59	324
Syphilis.....		8	6	62	37	12	2	10	13	150
Other forms.....				1					1	2
Whooping cough.....		94		65			8	9		176

FINLAND

Notifiable diseases—May 1948.—During the month of May 1948, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	9	Paratyphoid fever.....	127
Diphtheria.....	195	Poliomyelitis.....	7
Dysentery.....	17	Scarlet fever.....	401
Gonorrhea.....	1,073	Syphilis.....	302
Malaria.....	11	Typhoid fever.....	24

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India (French)—Pondicherry.—During the week ended July 17, 1948, 35 cases of cholera were reported in Pondicherry, French India.

Plague

Belgian Congo—Stanleyville Province.—During the week ended August 7, 1948, 1 fatal case of plague was reported in the village of Loga, northeast of Blukwa, in Stanleyville Province, Belgian Congo.

Indochina (French)—Cochinchina—Cape Saint James.—During the week ended July 24, 1948, 1 fatal case of plague was reported at Cape Saint James, Cochinchina, French Indochina.

Smallpox

British East Africa—Nyasaland.—For the week ended July 17, 1948, 121 cases of smallpox with 9 deaths, were reported in Nyasaland, British East Africa, including 52 cases, 5 deaths in Blantyre.

India (Portuguese).—During the period February 1–June 26, 1948, 131 cases of smallpox were reported in Portuguese India.

Portuguese East Africa—Mozambique.—For the week ended July 3, 1948, 31 cases of smallpox, with 3 deaths, were reported in Mozambique, Portuguese East Africa.

Sumatra.—During the period July 20–August 2, 1948, 223 cases of smallpox, with 43 deaths, were reported in Sumatra, including 214 cases, 43 deaths in Palembang Residence (7 of these cases in the city of Palembang).

Typhus Fever

Eritrea—Massawa.—For the week ended July 3, 1948, 5 cases of typhus fever were reported in Massawa, Eritrea.

Yellow Fever

Brazil—Rio Grande do Sul State.—On April 28, 1948, 1 fatal suspected case of yellow fever was reported in Sao Luiz Gonzaga, Rio Grande do Sul State, Brazil.

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